

# EUROPEAN PATENT OFFICE

## Patent Abstracts of Japan

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TITLE : THIN FILM MAGNETIC SENSOR

ABSTRACT : PURPOSE: To create pulses in a pick-up by crystallizing on a substrate two layers of a magnetic thin film (soft film) with small magnetism holding force and a magnetic thin film with large magnetism holding force and reversing the magnetizing direction of the soft thin film by means of a medium size magnetic field.

CONSTITUTION: A 65Ni35Fe or 42Ni28Fe30Co soft film and a 23Ni77Fe or 17.5Ni52.5Fe30Co hard film are condensed on a (soda-lime) glass plate (substrate) by the vacuum evaporation technique. After those soft film and hard film are stacked and crystallized, they are made long rectangular plates of 1mmx10mm by means of a photolithography, and on them SiO<sub>2</sub> films are crystallized by spattering SiO<sub>2</sub> to form an insulation film. The three films on the glass plate as substrate is cut off by a dicer to form chips, and a coil of 60μφ is wound with 10T/mm winding density on a chip to form a thin film magnetic sensor. The sensor formed in this way is capable of developing against variation in external magnetic field a large pulse voltage which is steep and does not depend on variation in velocity.

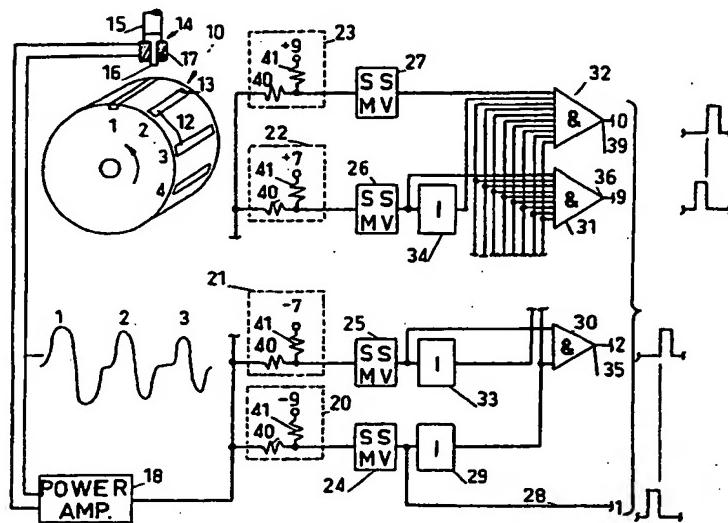
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## ELECTRICAL IMPULSE GENERATOR

V. C. Martin



The impulser employs a single transducer for generating a plurality of electrical impulses. In certain instances, it is physically difficult to arrange a series of transducers relative to movable impulse generating apparatus. However, generally a single transducer can be properly positioned. The device is suited to indicate discrete positions of a moving member. The movement of the member to be positioned is translational or rotational.

The rotatable non-magnetic drum 10 has a plurality of arcuately spaced, outwardly opening slots 12, each of different depth. Slots 12 are filled with bars of ferromagnetic material 13. Pickup head 14 is mounted close to the surface of 10. Head 14 consists of a permanent magnet 15. It is fixed at one end to soft iron core 16 having turns of wire 17.

When any bar 13 passes under head 14, the magnetic path reluctance is momentarily reduced. This results in an increase in the number of lines of magnetic flux linking turns 17. Since each bar 13 varies in size or in width, the change in reluctance of the magnetic path varies differently as bars 13 pass head 14. The different signals are identified by voltage amplitude discriminating and decoding circuitry.

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IBM Technical Disclosure Bulletin



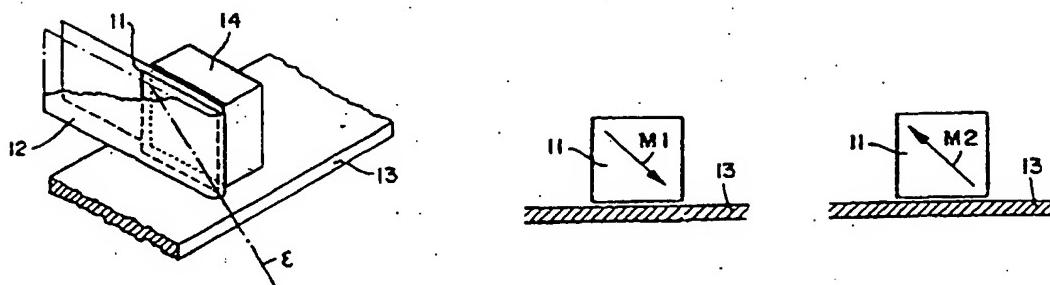
W. E. Proebster

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The magnetic transducer records information on and reads information from a magnetic record carrier.

The thin magnetic film 11 consists of soft magnetic material, e.g., permalloy, and exhibits a uniaxial anisotropy, easy direction  $\epsilon$ , at an angle of  $45^\circ$  to one of the edges of the film. Film 11 is very tightly surrounded by a stripline 12. This acts as the transducer coil. The transducer arrangement is supported by a rigid member 14.

The magnetization of the film is capable of assuming two opposite stable states  $M_1$  and  $M_2$ . The first is associated with a positive magnetic stray field at the recording surface 13, the second with a negative one. The magnetization is switched into either one of the two stable states by selectively supplying a current to the stripline. Switch-over takes place in coherent rotational switching mode. Readout is accomplished by the positive or negative stray field of the magnetized recording surface when it is moved relative to the transducer. Under this influence, the magnetization of the thin film is rotationally deflected out of its rest position so that voltage readout signals are induced in the stripline.